PREVENTIVE MEDICINE UPDATE

MADIGAN ARMY MEDICAL CENTER

Volume 19, Issue 2 September 2003

LATENT TUBERCULOSIS INFECTION (LTBI): FACT VERSUS FICTION

By: Sheryl A. Bedno

It is important to dispel the myths associated with the detection and treatment of LTBI. Many patients, as well as healthcare providers, are not familiar with the most recent guidelines on tuberculosis. Emphasizing the facts and correcting the fiction can lead to better compliance as well as improved resource utilization. One of the many roles of the physician is to conduct the initial evaluation of patients with LTBI. Chemoprophylaxis is then prescribed if appropriate. Patients can be referred to Preventive Medicine for this purpose. After this initial evaluation, patients are seen on a monthly basis for monitoring and medical refills.

Fact: Tuberculosis is still one of the leading causes of death worldwide with 1 to 2 million deaths per year. It is estimated that one-third of the world's population has LTBI.

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Pertussis Outbreak in Puget Sound

By: Kent S. Bennett

Last week, public health officials from Seattle-King County announced a jump in the number of infant pertussis cases occurring this year. They report that there have been 189 cases to date this year. This is the highest amo unt reported in 25 years. Twenty-eight of the pertussis cases have been in infants less then 7 months old. Compare this to the 10 cases among that occurred in that age grouping by this time last year. Although the number of fatalities caused by this disease is low in the United States (less then 1 % for infants less then 6 months old); approximately 80% of the deaths that do occur are in children less then 1 year old.

Pertussis is an acute bacterial disease affecting the respiratory tract. The initial stage starts with an irritating cough that worsens to become paroxysmal. The cough often persists up to 2 months. The paroxysms are violent and can be followed by a characteristic inspiratory whoop and the expulsion of thick mucus. However, infants less then 6 months old, adolescents and adults often do not have the typical whoop, post-tussive emesis, or syncope.

The frequency of pertussis cases has been increasing in recent years especially among adolescents and young adults, many of who were immunized, and seems to indicate

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Contact Preventive Medicine:
Page 596-9367 or call 968-4479.
Send consults by CHCS.
Website: http://www.mamc.amedd.army.mil/preventive_med/main_pm.htm

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Fiction: The military is a high risk group and a tuberculin reaction greater than 10mm should be considered positive.
The military as a whole is not a high risk group. It is important to determine an individual's risk factors and then determine the appropriate level of tuberculin reaction positivity:

Positive Reaction:
≥ 5 mm: HIV-positives, recent contacts of TB cases, organ transplant patients, or fibrotic changes on chest x-ray consistent with old-healed TB
≥ 10 mm: Recent arrivals from high-prevalence countries (< 5 years), injection drug users, residents/employees of high-risk congregate settings, mycobacteriology lab personnel, persons with conditions that place them at high risk, children less than 4, or children or adolescents exposed to adults in high-risk categories
≥ 15 mm: Persons with no known risk factors for TB

Fact: About 10% of immunocompetent persons with LTBI will develop active tuberculosis (TB) at some time in life and about half of this risk occurs within the first two years after infection. The risk of developing TB is even higher for individuals with diseases such as diabetes or chronic renal failure. Studies suggest that the risk of developing TB is 7-10% each year for persons who are HIV positive.

Fiction: A patient with a history of a positive TST should have routine TSTs in the future.
No. No further TSTs should be applied for individuals known to have a positive TST previously. There are some exceptions. For example, there is doubt about the reading of a TST, such as the prior reading ignored induration.

Fact: The recommended treatment of LTBI is 9 months of isoniazid (INH). This must be a minimum of 270 doses administered within 12 months. Other treatment regimens are available but some do not have the same quality of evidence. Recently, the American Thoracic Society and Center for Disease Control (CDC) have recommended against the combination treatment of rifampin plus pyrazinamide daily for 2 months because of associated severe liver injury.

Fiction: Because of the hepatotoxicity associated with INH, everyone should receive liver function tests (LFTs) at baseline as well as monthly throughout INH treatment.
No, routine testing is no longer necessary in the absence of hepatitis risk factors (history of hepatitis, alcohol abuse, use of certain medications, etc.). A thorough patient history and focused physical exam can help determine if liver function tests are appropriate.

Fact: A TST (tuberculin skin test) "converter" is defined as an individual who has an increase of 10mm or greater in the size of induration within a 2-year period while a TST "reactor" is defined as an individual with a positive skin test. LTBI includes both converters and reactors and are treated with INH or other acceptable regimen.

Fiction: If a patient received the BCG vaccine as a child, he or she will always have a positive reaction and thus screening for LTBI is not necessary.
Tuberculin skin testing is **not** contraindicated for BCG-vaccinated persons. An individual who has been BCG-vaccinated is considered having LTBI and should be treated if the skin test reaction is greater than 10 mm and any of the following are present: had contact with another person with active TB, was born or has resided in a high TB prevalence country, or is continually exposed to populations where TB prevalence is high. Since the incidence of TB is high in countries that have BCG vaccination programs, a positive TST should generally be evaluated independently of the BCG history. The bottom line is that individual determination is based on the time since BCG vaccination plus exposure history.

Fact: LTBI is one of the reportable diseases and conditions.
Yes, it is reportable to the local health department per Tacoma-Pierce County Health regulation. This is fairly specific to Tacoma-Pierce County and may not be reportable in other counties.

Please refer to the references below for more information on LTBI. Questions can be directed to the Department of Preventive Medicine.

References:
- Core Curriculum on Tuberculosis. Available at: http://www.cdc.gov/nchstp/tb/pubs/corecurr/.
- Army Regulation (AR) 40-5, Preventive Medicine, 15 Oct 90.
- Memorandum, Office of The Surgeon General, DASG-PPM-SA, 27 May 2003, subject: Army Latent Tuberculosis Infection (LTBI) Surveillance and Control Program.

TEST YOUR PREVENTIVE MEDICINE KNOWLEDGE!

by Sheryl Bedno and Kent Bennett

1. Heat injuries are _____.
A. Not Reportable
B. Reportable only to the Military
C. Reportable only to Tacoma Pierce County Health department
D. Reportable to both the military and TPCHD

2. The _____ mosquito is the most common carrier of West Nile Virus.
A. *Anopheles gambiae*
B. *Anopheles aquasalis*
C. *Aedes aegypti*
D. *Culex pipiens*

3. The average risk of HIV infection after a needlestick or cut exposure to HIV-infected blood is ____%.
A. 0.03%
B. 5%
C. 1%
D. 0.3%

4. The phenomenon in which people have a tendency to change their behavior because they are the target of special interest and attention in a study, regardless of the specific nature of the intervention they may be receiving is known as:
A. placebo effect
B. coercive theory
C. Maslow's Hierarchy of Needs
D. Hawthorne effect

5. A soldier that is a heat causalty has near normal, stable vital signs; is able to drink fluids; has normal mentation; and is expected to recover within the hour. Treatment should begin _____.
A. at the emergency department
B. in the ambulance
C. immediately on recogition of the injury
D. at mission completion

Answers:
1. B 2. D 3. D 4. D 5. C

Test continued in future issues

Pertussis - continued from page 1

waning immunity. Nonimmunized children are also implicated as reservoirs. Pertussis is highly communicable and spread by contact with respiratory discharges. Note that communicability begins about 2 weeks before the paroxysmal phase during the initial catarrhal stage. Communicability decreases over the course of the infection. Treatment with erythromycin shortens the course of communicability to about 5 days, as well as can decrease the disease severity if started early in the catarrhal stage.

The most important step in protecting the public is ensuring that all children under 7 years old are up to date on their vaccines against *Bordetella pertussis.* The vaccine is a combination vaccine containing either whole cell (DPT) or acellular (DTaP) pertussis vaccine. However, the acellular preparation is the preferred vaccine for all the doses due to fewer systemic adverse events when compared to the whole cell vaccine. Primary immunization consists of four doses of DTaP vaccine. The first doses are typically given at 2, 4 and 6 months of age. A fourth dose is given at 15-18 months. It is important to separate the third and fourth dose by at least 6 months. A fifth dose is recommended at 4-6 years of age if the fourth dose is given before the fourth birthday. The fifth dose should not be administered before age four. In general, the pertussis vaccine is not advised in children older then 7 years as reactions may be increased in older children and adults.

Other steps to decrease transmission include covering one's mouth when coughing and strict hand washing, especially when handling infants. Further, all coughs of two weeks duration or longer should be investigated for pertussis. Finally, all cases should be considered contagious until they complete at least 5 days of a fourteen-day course of erythromycin.

References:

-Control of Communicable Disease Manual, 17th Ed.

-King Co. Public Health Release. Available at: http://www.metrokc.gov/health/news/03092401.

Altitude Related Illnesses

By: Alden Weg

Many people in the western United States engage in recreational activities at altitudes that place them at risk for altitude-related illnesses. If you or your patients hike, mountain climb, mountain bike or ski at high altitude, it is important to be aware of the symptoms, treatment, and methods to prevent these altitude-related illnesses. It is also important to understand that altitude has the potential to complicate or exacerbate common medical conditions such as pulmonary disease, coronary disease, pregnancy, and hemoglobinopathies.

The three primary altitude-related illnesses that will be discussed are acute mountain sickness (AMS), high altitude pulmonary edema (HAPE), and high altitude cerebral edema (HACE). The risk of developing these conditions is related to the maximum altitude attained, rate of ascent, length of altitude exposure, level of exertion, and physiologic susceptibility. Rapid ascent to elevations higher than 2500 m (8202 feet) places individuals at much higher risk of an altitude related illness. For example, 67% of climbers who attempt to climb Mount Rainer (which is usually a 2 day climb to 4392 meters (14,410 ft)) experience AMS compared to 30% of climbers on Mt McKinley (a 3-7 day climb to 6194 m (20,320 ft))[1].

Acute mountain sickness (AMS) is the most common of the altitude related illnesses, but is often misdiagnosed. The symptoms are non-specific and may mimic conditions such as viral illness, dehydration, or alcohol hangover. Essentially all people experience headache as the primary symptom. Other symptoms include nausea, vomiting, dyspnea, dizziness, fatigue, anorexia, and sleep disturbances. These symptoms in the setting of a rapid ascent in altitude should be considered AMS until proven otherwise. Appropriate recognition and treatment of AMS is important to ensure it does not progress to HAPE or HACE.

AMS with mild symptoms can be treated by stopping further ascent until acclimatized or descending to lower altitudes (usually a 500 m descent) if necessary. Acetazolamide 125 to 250 mg orally twice daily for 3-4 days speeds up acclimatization (to begin 24 to 48 hours before ascent). Symptomatic treatment with analgesics and anti-emetics should also be initiated as needed. Moderate AMS symptomatology should be treated by immediate descent, acetazolamide, and supplemental oxygen if available. Some experts recommend the use of Dexamethasone (4 mg orally every 6 hours) if descent is not possible.

High altitude cerebral edema (HACE) is probably a severe form of AMS. It typically occurs in 2-3% of climbers at altitudes above 5500 m (18,000 feet), but may occur at any altitude above 2500 m. HACE is a progression to encephalopathy in the setting of AMS. It is manifested by ataxic gait, confusion, stupor, drowsiness, severe lassitude, or coma, in addition to severe headache and other symptoms of AMS. Hallucinations, hemiparesis, seizures and cranial nerve palsies may also develop. AMS may progress to HACE in as little as 12 hours, but usually occurs over 1-3 days.

Immediate descent/evacuation is critical for treatment of HACE. Supplemental oxygen, dexamethasone, and hyperbaric therapy should be started as soon as possible to improve the outcome.

High-altitude pulmonary edema (HAPE) is the most common cause of death related to high altitude. One in 10,000 skiers in Colorado develop this condition.[1] HAPE can develop at any elevation higher than 2500 m (8200 ft), and is most common on the second night. The incidence is slightly higher in men. Symptoms include dyspnea on exertion, fatigue, weakness, and dry cough. Common signs are tachypnea, tachycardia, rales, cyanosis, and a temperature elevation is common.

Immediate descent is also required for treatment of HAPE. Exertion of the victim must be minimized during the descent. Attempt to keep the victim warm. Oral nifedipine 10 mg every 4 hours may reduce symptoms. Supplemental oxygen should be started at 4 to 6 liters per minute and hyperbaric therapy may also be beneficial.

Prevention of altitude-related illnesses involves gradual ascent and acclimatization at 2,500 to 3,000 m for 2 or 3 nights before further ascent. Physical exhaustion, alcohol use, and use of sedative medications will

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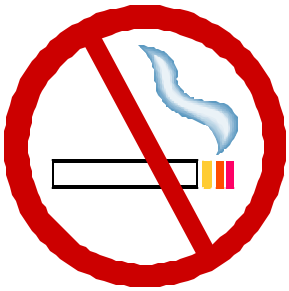

Tobacco Cessation Programs

By: Jason Wieman

Tobacco use is responsible for one in five deaths in the United States each year. It's ***the*** major preventable cause of emphysema, lung cancer, chronic bronchitis, heart disease and stroke. Oral tobacco is strongly associated with mouth and throat cancer. Inhaled nicotine is as addictive as heroin and cocaine, reaching the brain twice as fast as heroin injected into a vein.

Tobacco is the most heavily advertised product in the US. It costs the nation over $150 billion per year in health-care and indirect costs.

Lung cancer has surpassed breast cancer as the leading cause of cancer deaths among women. Smoking remains the #1 cause of cancer death in men. Almost all first time tobacco use in adolescents occurs before high school graduation and tobacco is often the first drug used by many who go on to use alcohol, marijuana and other drugs.

- Experience has shown that several factors enhance personal success in quitting tobacco: information and counseling on cessation, medication (as needed), and appropriate follow-up.
- An important program focus is supporting the needs of the individual. How you use tobacco affects what you need to stop. A variety of tools and resources are available to personalize your cessation efforts.
- All classes are available to all eligible health care beneficiaries, regardless of clinic enrollment.
- All classes are accessible thru the TRICARE REGIONAL APPOINTMENT CENTER at 1-800-404-4506

Relapse Prevention/ Support— A "Quit" fix, for additional support can be obtained by attending any of the Monday night classes.

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Option 1

4 class series held weekly and lasting 2 hours each session. Located in the Crone Room near the Medical Mall. Offered on Mondays:

20, 27 October 2003, 3 November 2003, at 3:00-5:00 PM

1, 8, 15 December 2003, at 6:00-8:00 PM

Booked thru TRICARE appointments.

Option 2:

One all day class, held on Saturdays, 9:00AM-5:00 PM. Again, located in the Crone Room.

Booked thru TRICARE.

Option 3:

3 class series held on Thursday mornings in the Family Practice Clinic's Resident library.

A new series starts each month. Sign up thru TRICARE.

INFORMATION SESSION: Tuesday noon each week, Okubo Clinic, North Fort Lewis

NICOTINE ANONYMOUS: Thursday Evenings at 1800, Cosio Room on the ground floor of the Nursing Tower, next to the ATM Machine.

Altitude illness - continued from page 4

predispose a person to altitude illness. Individuals who are rapidly transported to altitudes higher than 4,000 m or plan on a rapid ascent (1 day or less) to altitudes greater than 3,000 m should consider prophylactic use of acetazolamide 125 to 250 mg twice a day 24 hours prior to ascent to reduce the incidence or altitude related illnesses. The use of dexamethasone for prevention of AMS is controversial and is generally not recommended.

[1] Klocke DL, Decker WW, Stepanek J. Altitude-Related Illnesses. Mayo Clin Proc 1998;73:988-993.